Change in Total Energy and Entropy

	Dry	Moist
FV3	2.60940×10^9	2.70582×10^9
MPAS	2.61553×10^9	2.71298×10^9
GFS	2.62432×10^9	2.75926×10^9

	Dry	Moist
FV3	5.94928×10^7	5.98166×10^7
MPAS	5.95828×10^7	5.98986×10^7
GFS	5.96772×10^7	5.98812×10^7

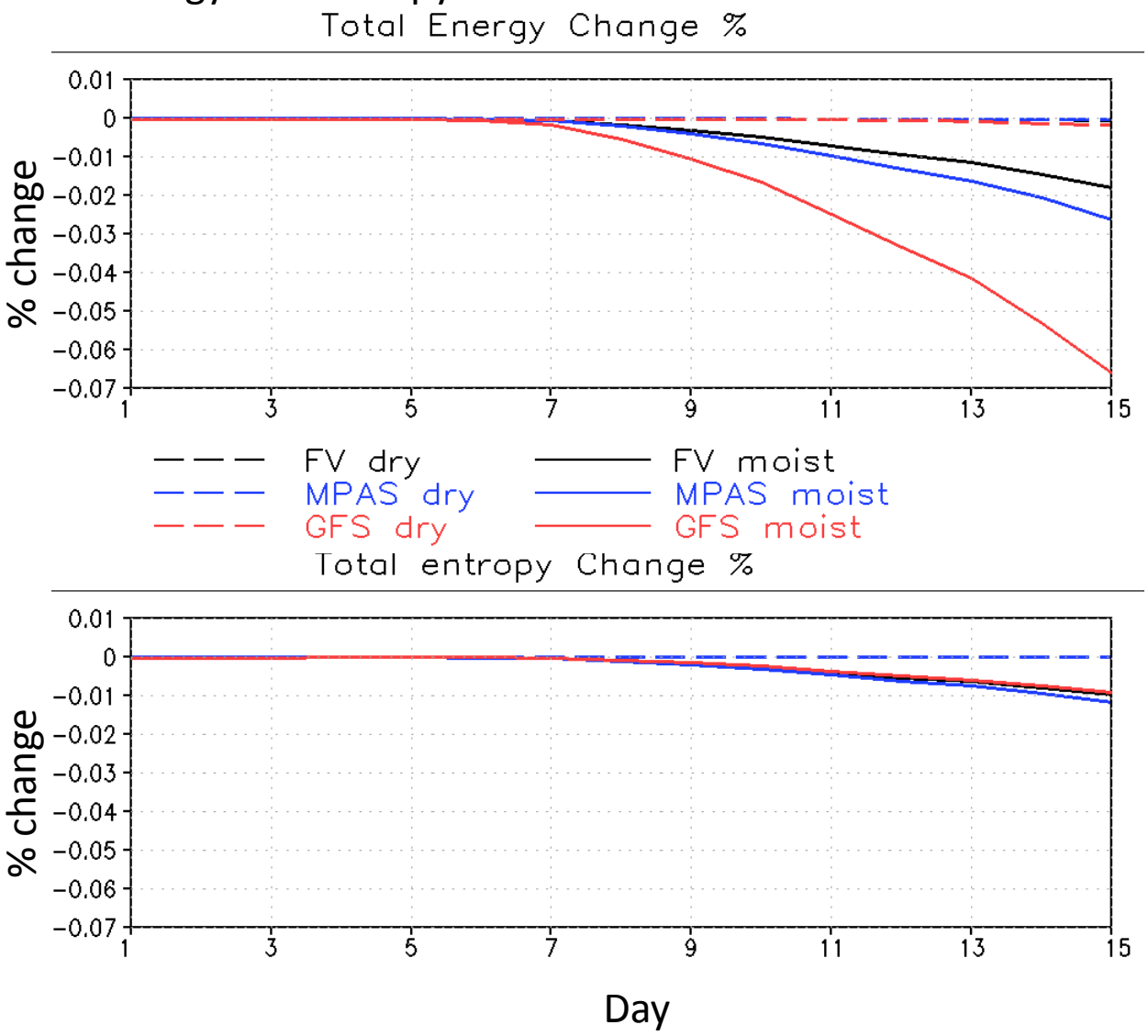
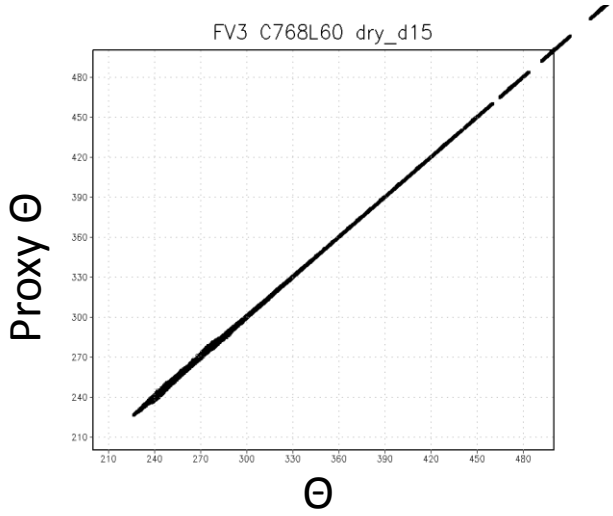


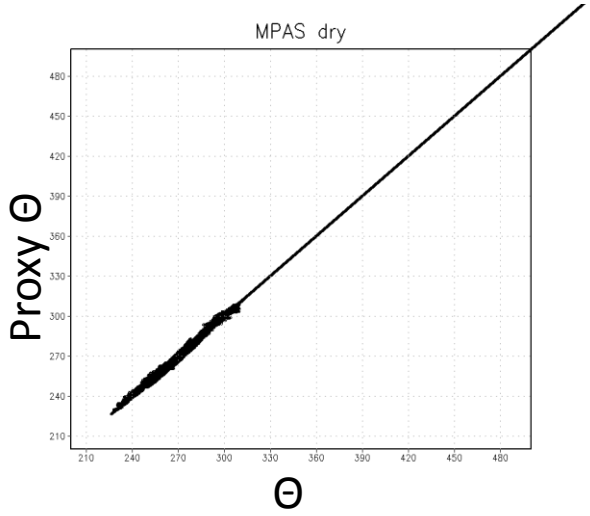
Figure 1. Change in total energy (top) and entropy (bottom) as a percent change from the initial value. Table shows the initial values. Formula for Total Energy is based on equation 44 in Thuburn 2015, and entropy equation is based on eq. 4 in Woollings and Thuburn 2006.

Potential Temperature Conservation (Day 15)

FV^3 RMS=0.035



MPAS RMS=0.089



GFS RMS=0.398

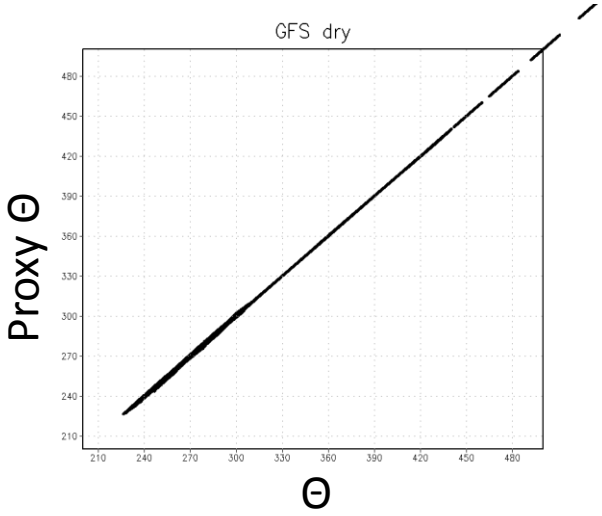
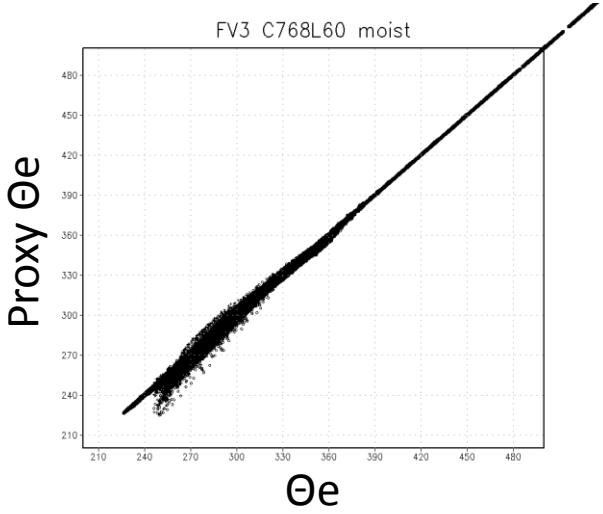


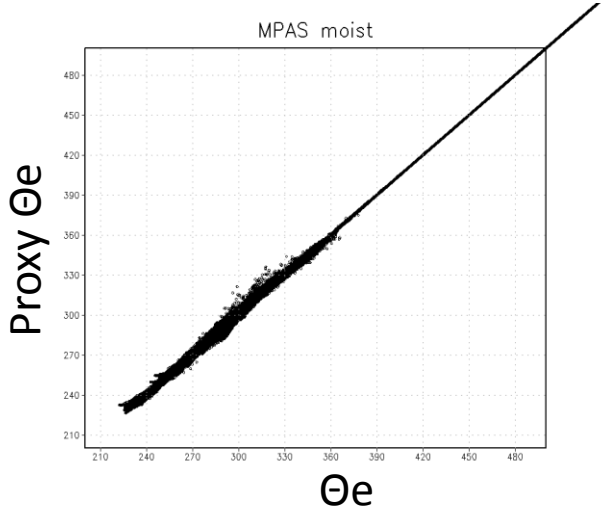
Figure 2: Scatterplot of Θ and proxy Θ (tracer) at day 15 of the integration of the dry baroclinic wave (test 4.1). RMS values in title are the global mass weighed RMS.

Equivalent Potential Temperature Conservation (Day 15)

FV3 RMS=0.227



MPAS RMS=0.286



GFS RMS=0.700

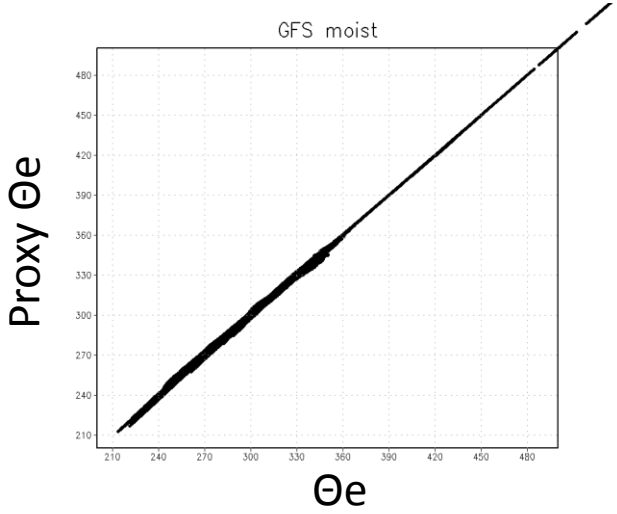
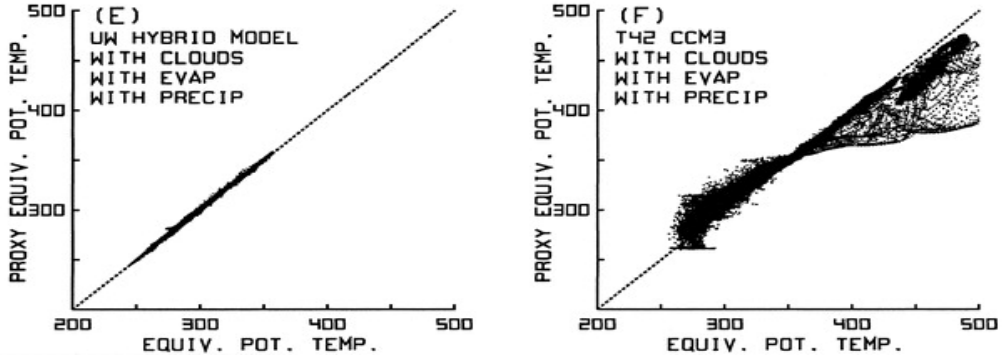


Figure 3: Scatterplot of Θe and proxy Θe (tracer) at day 15 of the integration of the moist baroclininc wave (test 4.2). Compare with figure 1 of Johnson et al. 2000.



Day-10 scatter plots from Johnson et al. 2000